

L Number	Hits	Search Text	DB	Time stamp
1	0	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 exhaust near20 chamber) and ((automatic or automatically or automate or automation or automated) near10 (sampling or sample or sampler or sampled or specimen))	IBM_TDB	2003/09/27 16:42
2	6	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 exhaust near20 chamber) and ((automatic or automatically or automate or automation or automated) near10 (sampling or sample or sampler or sampled or specimen))	US-PGPUB	2003/09/27 16:16
3	0	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 exhaust near20 chamber) and ((automatic or automatically or automate or automation or automated) near10 (sampling or sample or sampler or sampled or specimen))	EPO	2003/09/27 16:16
4	0	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 exhaust near20 chamber) and ((automatic or automatically or automate or automation or automated) near10 (sampling or sample or sampler or sampled or specimen))	JPO	2003/09/27 16:17
5	1	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 exhaust near20 chamber) and ((automatic or automatically or automate or automation or automated) near10 (sampling or sample or sampler or sampled or specimen))	DERWENT	2003/09/27 16:17
6	0	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 exhaust near20 chamber) and ((automatic or automatically or automate or automation or automated) near10 (sampling or sample or sampler or sampled or specimen))	USOCR	2003/09/27 16:18

7	1	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 exhaust near20 chamber) and ((automatic or automatically or automate or automation or automated) near10 (sampling or sample or sampler or sampled or specimen))	USPAT	2003/09/27 16:19
8	0	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 signal near20 chamber) and ((sampling or sample or sampler or sampled or specimen) near15 exhaust near15 chamber)	IBM_TDB	2003/09/27 16:42
9	5	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 signal near20 chamber) and ((sampling or sample or sampler or sampled or specimen) near15 exhaust near15 chamber)	US-PGPUB	2003/09/27 16:28
10	0	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 signal near20 chamber) and ((sampling or sample or sampler or sampled or specimen) near15 exhaust near15 chamber)	EPO	2003/09/27 16:28
11	0	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 signal near20 chamber) and ((sampling or sample or sampler or sampled or specimen) near15 exhaust near15 chamber)	JPO	2003/09/27 16:28
12	0	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 signal near20 chamber) and ((sampling or sample or sampler or sampled or specimen) near15 exhaust near15 chamber)	DERWENT	2003/09/27 16:29
13	0	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 signal near20 chamber) and ((sampling or sample or sampler or sampled or specimen) near15 exhaust near15 chamber)	USOCR	2003/09/27 16:29

14	8	(fabrication or fabricating or fabricater or fabricator or fabricate or fabricated) and ((monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or testing or tested or tester or test or detect or detected or detection or detecting or detector or detecter) near20 signal near20 chamber) and ((sampling or sample or sampler or sampled or specimen) near15 exhaust near15 chamber)	USPAT	2003/09/27 16:29
15	0	(wafer near (processing or processed pr processer or processor)) and (chamber near10 exhaust) and ((particle near (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) near15 exhaust) and ((particle with (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) with ((sampling or sample or sampler or sampled or specimen) near10 exhaust))	IBM_TDB	2003/09/27 16:49
16	1	(wafer near (processing or processed pr processer or processor)) and (chamber near10 exhaust) and ((particle near (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) near15 exhaust) and ((particle with (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) with ((sampling or sample or sampler or sampled or specimen) near10 exhaust))	US-PGPUB	2003/09/27 16:50
17	0	(wafer near (processing or processed pr processer or processor)) and (chamber near10 exhaust) and ((particle near (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) near15 exhaust) and ((particle with (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) with ((sampling or sample or sampler or sampled or specimen) near10 exhaust))	EPO	2003/09/27 16:50
18	0	(wafer near (processing or processed pr processer or processor)) and (chamber near10 exhaust) and ((particle near (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) near15 exhaust) and ((particle with (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) with ((sampling or sample or sampler or sampled or specimen) near10 exhaust))	JPO	2003/09/27 16:51

19	1	(wafer near (processing or processed pr processer or processor)) and (chamber near10 exhaust) and ((particle near (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) near15 exhaust) and ((particle with (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) with ((sampling or sample or sampler or sampled or specimen) near10 exhaust))	DERWENT	2003/09/27 16:51
20	0	(wafer near (processing or processed pr processer or processor)) and (chamber near10 exhaust) and ((particle near (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) near15 exhaust) and ((particle with (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) with ((sampling or sample or sampler or sampled or specimen) near10 exhaust))	USOCR	2003/09/27 16:51
21	0	(wafer near (processing or processed pr processer or processor)) and (chamber near10 exhaust) and ((particle near (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) near15 exhaust) and ((particle with (monitor or monitored or monitoring or analyze or analyzed or analyzing or analyzer or analyzor or sensor or sensing or sensed or sense or detect or detected or detection or detecting or detector or detecter)) with ((sampling or sample or sampler or sampled or specimen) near10 exhaust))	USPAT	2003/09/27 16:52
22	0	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n001/22 or g01n001/40).ipc. or (73/863.01 or 73/863.23 or 73/863.86 or 73/863.57).ccls.)	US-PGPUB	2003/09/27 17:52
23	0	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n001/22 or g01n001/40).ipc. or (73/863.01 or 73/863.23 or 73/863.86 or 73/863.57).ccls.)	EPO	2003/09/27 16:56
24	20	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n001/22 or g01n001/40).ipc. or (73/863.01 or 73/863.23 or 73/863.86 or 73/863.57).ccls.)	JPO	2003/09/27 17:19
25	5710984	(JP-2002299402-\$ or JP-2002040009-\$ or JP-2001289770-\$ or JP-2001237293-\$ or JP-2001221723-\$ or JP-2001091504-\$ or JP-2001053124-\$ or JP-2000088717-\$ or JP-11297784-\$ or JP-11044619-\$ or JP-09089734-\$ or JP-09043117-\$ or JP-08321535-\$ or JP-06288881-4 or JP-06241960-\$ or JP-05315421-\$ or JP-05283498-\$ or JP-04324338-\$ or jp-04225526-\$ or JP-63201551-\$).did.	DERWENT	2003/09/27 17:05
26	19	(JP-2002299402-\$ or JP-2002040009-\$ or JP-2001289770-\$ or JP-2001237293-\$ or JP-2001221723-\$ or JP-2001091504-\$ or JP-2001053124-\$ or JP-2000088717-\$ or JP-11297784-\$ or JP-11044619-\$ or JP-09089734-\$ or JP-09043117-\$ or JP-08321535-\$ or JP-06288881-4 or JP-06241960-\$ or JP-05315421-\$ or JP-05283498-\$ or JP-04324338-\$ or jp-04225526-\$ or JP-63201551-\$).did.	DERWENT	2003/09/27 17:06

27	26	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n001/22 or g01n001/40).ipc. or (73/863.01 or 73/863.23 or 73/863.86 or 73/863.57).ccls.)	DERWENT	2003/09/27 17:22
28	0	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n001/22 or g01n001/40).ipc. or (73/863.01 or 73/863.23 or 73/863.86 or 73/863.57).ccls.)	USPAT	2003/09/27 17:22
29	0	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and g01n001/00.ipc.	US-PGPUB	2003/09/27 17:25
30	0	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and g01n001/00.ipc.	EPO	2003/09/27 17:25
31	59	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and g01n001/00.ipc.	JPO	2003/09/27 17:26
32	67	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and g01n001/00.ipc.	DERWENT	2003/09/27 17:50
33	1	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and g01n001/00.ipc.	USPAT	2003/09/27 17:50
34	0	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n015/00 or g01n015/06).ipc. or (73/28.01 or 73/865.5 or 73/28.04).ccls.)	US-PGPUB	2003/09/27 17:54
35	0	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n015/00 or g01n015/06).ipc. or (73/28.01 or 73/865.5 or 73/28.04).ccls.)	EPO	2003/09/27 17:54
36	32	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n015/00 or g01n015/06).ipc. or (73/28.01 or 73/865.5 or 73/28.04).ccls.)	JPO	2003/09/27 18:04
38	5	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n015/00 or g01n015/06).ipc. or (73/28.01 or 73/865.5 or 73/28.04).ccls.) and (sample or sampling or sampled or sample or specimen)	DERWENT	2003/09/27 17:56
37	6	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n015/00 or g01n015/06).ipc. or (73/28.01 or 73/865.5 or 73/28.04).ccls.) and (sample or sampling or sampled or sample or specimen)	JPO	2003/09/27 18:00
39	5	(JP-10173017-\$ or JP-01261832-\$ or JP-01122132-\$ JP-63238445-4 or JP-63019832-\$ or JP-61202139-\$).did.	DERWENT	2003/09/27 18:02
40	2	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n015/00 or g01n015/06).ipc. or (73/28.01 or 73/865.5 or 73/28.04).ccls.)	USPAT	2003/09/27 18:04

S #	Updt	Database	Query	Time
Comment				
S2087	U	JPAB	(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n001/00 or g01n001/22 or g01n001/40).ipc. or (73/863.01 or 73/863.23 or 73/863.86 or 73/863.57)!.ccls.) and chamber	2003-09-27
18:46:18	S2086	U	JPAB	
			(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n001/00 or g01n001/22 or g01n001/40).ipc. or (73/863.01 or 73/863.23 or 73/863.86 or 73/863.57)!.ccls.) and exhaust	2003-09-27
18:42:56	S2085	U	DWPI	
			JP-63238445-\$ did.	2003-09-27
18:38:47	S2084	U	JPAB	
			(h01l021/66.ipc. or (438/5 or 438/14).ccls.) and ((g01n015/00 or g01n015/06).ipc. or (73/28.01 or 73/28.04 or 73/865.5)!.ccls.) and (sample or sampling or sampler or sampled or specimen)	2003-09-27
18:33:45	S2083	U	JPAB	
			(JP-2000088717-\$ or JP-61202139-\$ or JP-01261832-\$).did.	2003-09-27
18:25:00				

WEST

End of Result Set

L1: Entry 3 of 3

File: JPAB

Sep 6, 1986

PUB-NO: JP361202139A

DOCUMENT-IDENTIFIER: JP 61202139 A

TITLE: REFERENCE PARTICLE ATTACHING APPARATUS

PUBN-DATE: September 6, 1986

INVENTOR-INFORMATION:

NAME	COUNTRY
HIRATSUKA, HACHIRO	

ASSIGNEE-INFORMATION:

NAME	COUNTRY
TOSHIBA CORP	

APPL-NO: JP60043908

APPL-DATE: March 6, 1985

US-CL-CURRENT: 73/865.5; 118/318

INT-CL (IPC): G01N 1/00; H01L 21/66

ABSTRACT:

PURPOSE: To enable the production of a reference wafer for calibration, by arranging a reference particle measuring section for measuring merely dispersed reference particles generated at a reference particle generating section and a reference attaching section for evenly dispersing and attaching the merely dispersed reference particles on the surface of a sample.

CONSTITUTION: At a reference particle generating section 11, air is taken in with a diaphragm pump 21, made to pass through a water-cooled trap 22, a water separator 23 and dryers 24 and 25 to remove water and then, the dry air is got passed through an atomizer 29. Reference latex particles blown from the atomizer 29 is merely dispersed with the passage of the dry air to be introduced into an aerosol mixing tube 32 and the reference particles merely dispersed in the dry air flows at equal flow rate to a reference particle measuring section 12 and a reference particle attaching section 13. The measuring section 12 measures the particle size and the number of the reference particles. The reference particles flown into the attaching section 13 are introduced into a wafer container 34 to be attached to the surface of a silicon wafer 36 at a uniform density passing through a reference particle diffusion plate 35. Thus, particles usable as reference wafer for calibration can be attached.

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L2: Entry 4 of 6

File: JPAB

Oct 4, 1988

PUB-NO: JP363238445A
DOCUMENT-IDENTIFIER: JP 63238445 A
TITLE: DUST MEASURING APPARATUS

PUBN-DATE: October 4, 1988

INVENTOR-INFORMATION:

NAME COUNTRY
MIZOGAMI, KAZUAKI

ASSIGNEE-INFORMATION:

NAME COUNTRY
HITACHI LTD
HITACHI TOKYO ELECTRON CO LTD

APPL-NO: JP62071512

APPL-DATE: March 27, 1987

US-CL-CURRENT: 73/863.33

INT-CL (IPC): G01N 1/28; G01N 15/06; H01L 21/66

ABSTRACT:

PURPOSE: To measure fine dust and to enhance the reliability and yield of a semiconductor device, by attaining the bonding of dust through the atomization of vapor and measuring the bonded dust by a particle counter.

CONSTITUTION: Sampling gas (e.g., air) is introduced into a sub-housing 3 from the gas inflow pipe 4a thereof and vapor is introduced into the sub-housing 3 through a vapor supply pipe 5a and, for example, the sampling gas is mixed with alcohol vapor under stirring. As a result, the alcohol vapor is formed into mist using dust as a nucleus and the dusts each becoming the nucleus through the formation of the mist are bonded. Thereafter, the mist is sent to the area under a heating lamp 6 and the alcohol component adhered to the bonded dust is removed. The bonded dust is sent to a particle counter 1 to measure the dust. By this method, the fine dust can be measured and the reliability and yield of a semiconductor device can be enhanced.

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End of Result Set

L3: Entry 1 of 1

File: DWPI

Oct 4, 1988

DERWENT-ACC-NO: 1988-320333

DERWENT-WEEK: 198845

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TITLE: Measuring device to dust in gas - has vapour supply connected to supply of
misted vapour, immediately before dust particle counter NoAbstract Dwg 1/2

PATENT-ASSIGNEE:

ASSIGNEE	CODE
HITACHI LTD	HITA
HITACHI TOKYO ELECTRONIC	HITAN

PRIORITY-DATA: 1987JP-0071512 (March 27, 1987)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 63238445 A	October 4, 1988		004	

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP 63238445A	March 27, 1987	1987JP-0071512	

INT-CL (IPC): G01N 1/28; G01N 15/06; H01L 21/66

ABSTRACTED-PUB-NO:

EQUIVALENT-ABSTRACTS:

TITLE-TERMS: MEASURE DEVICE DUST GAS VAPOUR SUPPLY CONNECT SUPPLY MIST VAPOUR
IMMEDIATE DUST PARTICLE COUNTER NOABSTRACT

DERWENT-CLASS: S03 U11

EPI-CODES: S03-E13; S03-F; U11-C04A1;

WEST

 Generate Collection

L1: Entry 2 of 3

File: JPAB

Oct 18, 1989

PUB-NO: JP401261832A

DOCUMENT-IDENTIFIER: JP 01261832 A

TITLE: DUST COUNTER FOR CONTROLLING CLEANLINESS OF SEMICONDUCTOR MANUFACTURING EQUIPMENT

PUBN-DATE: October 18, 1989

INVENTOR-INFORMATION:

NAME	COUNTRY
KAI, MAKOTO	

ASSIGNEE-INFORMATION:

NAME	COUNTRY
NEC CORP	

APPL-NO: JP63089987

APPL-DATE: April 12, 1988

INT-CL (IPC): H01L 21/304; F24F 3/16; G01N 15/06; G01N 21/85; H01L 21/66; H01S 3/00

ABSTRACT:

PURPOSE: To accurately check cleanliness of equipment and manufacture stable semiconductor devices by a method wherein dry air cleaned by an air filter is blown to a part to be measured so as to blow up particles deposited on the semiconductor manufacturing equipment and blown up particles are sampled and measured.

CONSTITUTION: An aerodynamic focus nozzle 8 is double-structured whereby clean air cleaned by an air filter 3 is flowing in the outer nozzle and sample air is flowing in the inner nozzle. Inside of a detection cell 11 is not therefore contaminated, and air which has passed is discharged by a suction nozzle 9 and circulated after it is passed through a reservoir 12 and a pump 13 and filtered by the air filter 3. Particles in sample air passing through the detection cell 11 generate light scattering by a He-Ne laser 10 inside an active cavity. When this scattering is detected by the side-way scattering method in the detection cell 11, diameters of particles and the number of particles in sample air are counted by a particle measuring unit 1 so that cleanliness in a vacuum system of the semiconductor manufacturing equipment can be controlled.

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L1: Entry 1 of 3

File: JPAB

Mar 31, 2000

PUB-NO: JP02000088717A

DOCUMENT-IDENTIFIER: JP 2000088717 A

TITLE: DEVICE FOR COLLECTING TRACE AMOUNT OF ORGANIC MATTER

PUBN-DATE: March 31, 2000

INVENTOR-INFORMATION:

NAME	COUNTRY
SASAKI, HIROMI	

ASSIGNEE-INFORMATION:

NAME	COUNTRY
TOSHIBA MICROELECTRONICS CORP	
TOSHIBA CORP	

APPL-NO: JP10258717

APPL-DATE: September 11, 1998

INT-CL (IPC): G01 N 1/22; G01 N 1/24; H01 L 21/66

ABSTRACT:

PROBLEM TO BE SOLVED: To provide a device for collecting trace amounts of organic matter which has a simple constitution to be easily operated, capable of effectively removing trace amounts of organic impurities present on an object to be measured, collecting them almost without exception, analyzing them with high sensitivity, and furthermore collecting trace amounts of organic impurities not only at flat parts on the surface of the object to be measured but also at irregular parts, stepped parts, etc., without a hitch.

SOLUTION: A device for collecting trace amounts of organic matter is provided with a double tube 20 in which the tip faces of an inner tube 11 and an outer tube 12 are in an open state. Furthermore, the device is provided with a carrier gas supply part 13 to supply carrier gas from one end side of the outer tube 12 so as to blow the carrier gas out of the tip face of the outer tube 12, a pump 16 for sucking the carrier gas connected to one end side of the inner tube 11 so as to suck the carrier gas containing organic matter from the tip face of the inner tube 11, and a collecting tube 14 for collecting organic matter inserted into the carrier gas suction path between the inner tube 11 and the pump 16.

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